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CHRONIC CONSTIPATION

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A THESIS

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- by -

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## I N T R O D U C T I O N

In the experience of the General Practitioner there are few commoner ailments to be met with than those which are associated with derangements of the Alimentary System.

In the vast majority of such derangements, the cause lies either in excessive intake or in deficient output. Indiscretions in diet have their direct results in various forms of indigestion and indirectly lead to or aggravate the other factor of so much ill-health, namely, the imperfect removal of waste products from the economy.

If the average individual could be brought to understand the importance of regular and efficient evacuation of the bowels, much chronic ill-health might be prevented.

It is on account of its prevalence, of its far reaching ill effects and of the ignorance or want of thought displayed by the public that the subject of Chronic Constipation becomes of foremost importance to the Practitioner.

Constipation is a subject of frequent discussion and the medical literature on it is voluminous. It is beyond the scope of this thesis to deal at all fully with the subject.

I propose in the present thesis to give my own views on the subject based on personal experience and to deduce certain conclusions from these.

### DEFINITION

Constipation may be defined generally as a tendency to the accumulation of Faecal matter in the lower intestine; the evacuation being too small or too seldom, or too dry and too hard.

There is no fixed point at which the condition called Constipation begins and the normal state ends. In many people a daily evacuation is almost a necessity, whilst in others, three or four days may elapse without their suffering any inconvenience; in yet another class of persons much longer intervals may elapse without any apparent deleterious effects or discomfort arising.

It has been asserted on good authority that it was not necessary for the Rectum to be emptied every day, as there is room in the large intestine for the residuum of several weeks' consumption of food. The latter statement is quite true.

Ship Surgeons, especially in days when voyages were longer and ships less luxuriously equipped than they are now, could relate extraordinary instances in which women, who were unwilling to be seen visiting the closet, allowed

the lower bowel to remain full for weeks, with the result that the surgeon had finally to remove the scybala with the help of syringe and spoons.

Although such retention of faeces is possible without a more detrimental result than the extremely unpleasant way in which it may ultimately be necessary to empty the bowel, this does not imply that long retention of faeces is a good and healthy thing or that the current belief that the bowel ought to be emptied daily is erroneous.

Retention of faeces means retention of Coli Bacilli, multiplication of Bacilli, and possibly in successive generations increase of their virulence.

The bacilli in healthy faeces are innocuous, but the virulence may increase after a time, leading to inflammation of ovaries, Fallopian tubes, appendix, bladder, kidney, gall bladder, etc.

Serious consequences may also follow from the pressure of scybala, for example, stercoral ulcers, and such ulcers may perforate the bowel and so produce Peritonitis.

The normal standard may be taken as one action of the bowels each day, whether it occur in the morning or later; that all faecal material which has accumulated in the descending colon and iliac colon is passed daily. (Hertz)<sup>1</sup>



Constipation is not peculiar to any race or climate, occurs amongst all classes, in both sexes and at every period of life.

Women are more prone to suffer from the condition than men; in part owing to their different modes of life and their different avocations. Some writers suggest that modesty plays its part in the case of females; others think a possible reason may be that women take less in quantity of food and drink into their alimentary canal than men.

In infants an additional cause is the absence of non development of the volitional element in defaecation.

Whilst constipation exists as a symptom or complication in certain definite morbid conditions, it, at the same time, is so frequent amongst otherwise healthy people that it must, in the greater proportion of cases, be regarded not as a disease but rather as a natural result of artificial conditions on the healthy body.  
(Allbutt)<sup>2</sup>

We find confirmation of this in the fact that the condition is much more prevalent amongst civilised than amongst savage races. Several factors may be suggested to account for this.

The natural stimulus to movement of the bowels (peristalsis) is the mechanical and chemical irritation exerted by the bulk of the indigestible residue of the food.

The diet of the savage tribe is coarse and ill-cooked, whilst, to suit the greater refinement of taste and delicacy of palate of the more civilised races, much of the indigestible ingredient has been removed in manufacture, or has been softened in the process of cooking. (Allbutt)<sup>2</sup>

A free and active open air life is more conducive to bowel activity than is the sedentary existence or the harassing rush of modern city life.

The contents of the Small Intestine are invariably thin and watery in consistence; the absorptive power of the Large Intestine is greater than its secretory function, with the result that there is a noticeable change in its contents. Most of this absorption occurs in the Caecum and the Ascending Colon, though the Faecal contents still remain soft. There is a steady onward movement along the Transverse Colon, and, to a certain extent, absorption goes on, but it is when the stool reaches the Pelvic Colon, where it is detained until the act of Defaecation takes place, that the normal firm consistence is arrived at.

It is thus shown that Constipation, as defined is a condition which only exists in the Large Intestine.

It is therefore necessary to consider briefly the

## ANATOMY OF THE LARGE INTESTINE

The large intestine or Colon extends from the Right Iliac Fossa - from the termination of the Ilium - to the Anal Orifice. It rarely measures more than from 5 to 6 feet in length. The Colon is widest at its commencement and gradually diminishes in diameter as it advances towards its termination. Cunningham says that it is not uncommon to see the Descending Colon with a diameter not greater than the middle finger. The gut becomes dilated again in the Rectal portion.

The Colon is\*divided into:

Caecum and Vermiform Appendix.

Colon	{	Ascending Colon	
	{	Hepatic Flexure	
	{	Transverse Colon	
	{	Splenic Flexure	
	{	Descending Colon	
	{	Iliac Colon	Sigmoid Flexure (old style)
{	Pelvic Colon		
The Rectum	}		Rectum (old style)
The Anal Canal			

The more recent writers, Cunningham, Hertz, etc.<sup>3</sup> <sup>1</sup> have adopted the newer nomenclature of Jonnesco, in describing the parts formerly comprised under the name of Sigmoid Flexure and Rectum.

As indicated above, the Sigmoid Flexure is now represented by the Iliac Colon, which extends from the

lower end of the Descending Colon, at the level of the crest of the Ilium, to the internal border of the Psoas, and by part of the Pelvic Colon; the remainder of the latter represents what was formerly known as the First part of the Rectum - that is the first four inches.

What was formerly described as the Second part of the Rectum is now the whole Rectum - new style - while the Third part, - old style, - is known as the Anal Canal.

#### STRUCTURE OF THE LARGE INTESTINE.

The Large Intestine consists of Serous, Muscular, Submucous and Mucous coats.

The Serous Coat varies in the degree to which it envelops the bowel at various points, but for practical purposes, at present we merely note that the Caecum, Transverse Colon, and Pelvic Colon are usually completely surrounded by Peritoneum and have, through their Mesenteries, a certain amount of freedom of displacement or movement. In particular, this is to be remarked in connection with the Pelvic Colon; its Mesentery is long but its extremities are in close proximity, thus it forms a distinct loop, which, when empty, lies against the Rectum in the Pelvis, but which, as it becomes filled with faeces, rises up and becomes an abdominal organ (Hertz).<sup>1</sup>

The Muscular Coat consists of (a) a layer of external longitudinal fibres disposed in three flat bands, called Taeniae Coli. These, being shorter than the



intestinal tube, cause it to have a sacculated appearance. In the Pelvic Colon and Rectum these muscular bands spread round the bowel and invest it. (b) An internal circular layer, the fibres of which are equally distributed over the bowel, except at the Rectum and Anal Canal, where they are more pronounced, being thicker and more numerous round the Anal Canal to form the Internal Sphincter, which muscle is in a state of tonic contraction.

The Anal Canal is supported by the Levatores Ani.

Quite at the termination of the Anal Canal is the External Sphincter with which some fibres of the Levatores Ani mingle.

The Submucous Coat has nothing to distinguish it specially from its corresponding structure in the Small Intestine.

The Mucous Coat. The bowel is lined by columnar Epithelium.

There are no Villi but a considerable number of Solitary Glands, particularly in the Caecum, and Crypts of Lieberkuhn are freely scattered over the surface.

The Nerve Supply of the Colon, Rectum and Internal Sphincter is:

(1) From the lower lumbar region of the Sympathetic, through the Inferior Mesenteric Ganglia.

Stimulation of these fibres inhibits intestinal activity.



(2) Through branches from the Sacral Plexus, specially from the 3rd Sacral Nerve, which end in Auerbach's Plexus, between the longitudinal and circular layers of muscle in the intestinal walls. Stimulation of these increases the motor activity of the intestines.

The Levatores Ani and the External Sphincter are supplied from the 4th Sacral and the Inferior Haemorrhoidal branches of the Internal Pudic.

#### COMPARATIVE ANATOMY.

It is in the Mammalia that the Hind Gut, or Large Intestine, is most developed. In these its greater length has necessitated its being arranged in coils, in contrast to the straight Hind Gut of other Vertebrates.

The Large Intestine is much better developed in herbivorous mammals and in them it assists in the digestion of vegetable cellulose by reason of the presence of large numbers of bacteria which are able to digest cellulose.

In certain of the Herbivora, such as rabbits, and other marsupials, the Caecum and Vermiform Appendix are well developed and are active in the digestion of vegetable matter.

<sup>4</sup>  
Metchnikoff makes the striking suggestion that

the large intestine was so developed among mammals because these, for the most part, led very active lives, and, whether in pursuit of their prey, on the one hand, or being the pursued, the necessity to stop in order to empty the bowel was disadvantageous, whilst the possibility of retaining the faecal contents for considerable periods was very useful in the struggle for existence. In contrast, he points out that birds which do not require to cease their flight in order to defaecate, but can void whilst on the wing, have no large intestine; on the other hand, the ostriches and their allies, the largest known birds, are characterised by the absence of the power of flight and by rapidity of terrestrial locomotion, by which they escape from their enemies, and are the only birds in which the large intestine is well developed.

#### PHYSIOLOGY OF THE LARGE INTESTINE.

It has been established by experiment that, in mammals, digestion and assimilation of food are confined almost exclusively to the Small Intestine, and that the Large Intestine plays only the smallest part.

It is only in certain diseased conditions of the digestive tract in which, on account of increased peristaltic action, the contents of the Small Intestine with the digestive juices are passed quickly into

the Large Intestine, that some digestive work is done in the latter organ.

It is known that in the large intestine the contents of the gut give up their water and assume the solid form of faecal matter.

It is possible to nourish individuals for periods at a time, by rectal injection of certain nutritive substances, the most important of which is milk. While this is so, we know that the large intestine has a secretory function.

It pours out mucus, which serves to moisten the solid faecal material and so assists in its expulsion.

It follows that, in man, the large intestine has for its chief function the accumulation, preparation and elimination of the waste products of digestion.

The Large Intestine is not essential to life in man, as is shown by a case mentioned by Metchnikoff.<sup>4</sup> A woman suffered for thirty-seven years from Fistula of the small intestine, through which the waste matter of the alimentary canal was discharged. When the abdomen was opened, with a view to curing the fistula, it was found that the large intestine had atrophied in its whole length, from caecum to rectum, yet the individual had enjoyed quite normal health.

As will be seen later, surgeons have removed the major portion of the large intestine and patients

have suffered no permanent inconvenience in consequence.

Metchnikoff<sup>4</sup> goes much further. He considers that the large intestine in man is not only not essential, but that it is quite useless and is a fertile source of danger to his health and life. He looks upon it as merely a reservoir for the waste products of the digestive processes in which, more especially in constipated individuals, putrefaction is followed by absorption of poisonous products. He esteems it an asylum for harmful microbes. He points out also how frequently the large intestine is the seat of malignant growths and suggests that the comparative freedom of the small intestine from such is due to the latter retaining its contents for much shorter periods than does the large intestine.

He has no hesitation in asserting that the large intestine is an instance of arrested evolution fraught with baneful influences.

The Functions of the Large Intestine may then be enumerated as mainly absorptive and to act as a channel for the conveyance of the waste products of digestion from the body, but, in addition, it has a secretory function.

As the result of the recent investigations of Hertz<sup>1</sup> much valuable information has been obtained



as to the length of time which is occupied in the passage of food from the stomach, through the small intestine, thence into the large intestine; and much has been done to elucidate the process of defaecation and to clear up certain types of constipation which, hitherto, had not been understood. As a consequence also, a more rational treatment of constipation has been arrived at in many cases.

The method adopted by Hertz takes advantage of the fact that when food is mixed with a quantity of Bismuth salt, say the Carbonate, or preferably the Oxychloride, and the subject is X-rayed, the Bismuth laden food makes a very distinct shadow in the photo. In this way Hertz was able to follow the food from the time it reached the stomach until it was finally evacuated at the Anus. It was noted that food thus treated appeared in the Caecum, on an average, four and three quarter hours after it was taken into the stomach: that in the average individual it took a given time to pass thence through the different portions of the large intestine; thus the shadow reaches the Hepatic Flexure on an average  $6\frac{1}{2}$  hours after a meal is taken; the splenic flexure in 9 hours; the junction of the Descending Colon with the Iliac Colon in eleven hours, and the end of the iliac colon in 13 hours. The progress of the food through the Pelvic Colon is slower, say 6 hours, which makes 19



hours from the time of the meal entering the stomach.

The rate of collection in the Pelvic Colon depends also upon the amount of residue which is present from previous diets. The contents of the Colon are moved along by the peristaltic action of its muscular wall, this is set up by nervous reflexes acting through Auerbach's Plexus. A wave of contraction, preceded by a wave of relaxation, passes along the bowel and in this manner the contents are driven onwards.

Psychical stimuli may reflexly influence the movement of the Colon thus; pleasureable excitement may be followed by diarrhoea, anger may have an opposite effect.

The ingestion of food into the stomach has been proved to be the most powerful stimulus to the activity of the Colon. (Hertz<sup>1</sup>)

Reflexes, on the other hand, may arise locally in the Colon and are due to the mechanical or chemical stimuli created by the faecal contents. The more bulky the contents the more stimulating they are to the Colon. The more indigestible the food therefore the more residue reaches the Colon. Vegetarian diet, for instance, is found to be conducive to regular action of the bowels, this is due, doubtless, to the cellulose covering of fragments of food not having dissolved and hence an unduly bulky remainder

having resulted. Vegetable food also increases the amount of intestinal secretion and favours the development of larger numbers of bacteria. In these ways also the bulk of intestinal contents is increased.

The chemical stimuli depend upon certain constituents of the food or upon the products of its digestion and upon bacterial decomposition. Vegetable food is in this connection much more important.

Organic acids, such as Formic, acetic, butyric, tartaric, citric and lactic, which are the result of fermentation of carbohydrates, or are already present in vegetables and fruit, stimulate peristalsis.

Carbon Dioxide and marsh gas, produced by fermentation of carbohydrates and sulphuretted hydrogen produced by fermentation of proteins, stimulate peristalsis.

Animal diet, being more completely disintegrated and digested, leaves less residue, and is therefore, except for the possibility of the mechanical stimulation of larger masses which may have escaped digestion, and the sulphuretted hydrogen above alluded to, not of as much importance as a vegetarian diet.

The movements of the Colon are more sluggish during the night than throughout the day. This is due, in all probability, to the absence of stimulation from food and exercise.

## DEFAECATION.

As has been noticed already the Pelvic Colon, in which the gradual accumulation of faeces takes place, consists of a loop of bowel with rather free peritoneal attachments, its position therefore is not constant. When empty, it lies at an acute angle to the Rectum. As it fills with faeces it rises into the abdomen and thus undoes its flexion in relation to the Rectum; in so doing, it lessens the obstruction to the passage of faeces into the Rectum.

The desire to defaecate arises from the entrance into the Rectum of some of the contents of the Pelvic Colon. Normally, the Rectum is empty, except it may be for some small fragment of faeces left after a previous evacuation.

This call to defaecation may arise as a regular habit, independent of volition. In such a case, it is due to the renewal of physical activity after the period of rest; as for instance, the muscular exertion entailed in dressing; or, as in many people, it may primarily be due to the taking of food, this as we have seen, is the strongest stimulus to peristalsis.

It may occur as the result of auto-suggestion - be a part of the routine of a person's life - just as one considers it necessary to put on one's boots

of a morning, so the thought of the advisability to defaecate may result in the feeling of the desire to perform the act.

Then again it may be brought about by voluntary effort; by bringing the necessary muscular apparatus into play, faeces may be pressed into the Rectum and thus the normal reflex be started.

By whatever means the call comes, the mechanism of defaecation is the same. It consists in the taking of a deep inspiration, thus lessening the intra-abdominal space; the closure of the glottis, so as to maintain the resistance; the strong contraction of the diaphragm and the muscular walls of the abdomen, thus increasing the intra-abdominal pressure; this increased pressure causes more faeces to pass into the Rectum, thence, when the Rectum is full, into the Anal Canal.

The distension of the Rectum and the irritation of the Anal Canal set up influences which result in stimulating the centre in the lumbar spinal cord, in consequence of which strong peristaltic contractions of the Colon occur, together with contractions of the voluntary muscles of the abdominal wall and relaxation of both sphincters.

Gant<sup>5</sup> believes that the strongest factor in the propulsion of faeces through the Rectum during defaecation is a progressive invagination of the bowel



into the Rectum. This, he says, he has observed with the Sphygmoidoscope. Hertz<sup>1</sup> thinks that it can only be that the mucous membrane is invaginated.

Hertz<sup>1</sup>, by his observations, has satisfied himself that the whole of the Large Intestine is involved in these strong contractions, including the Caecum and the Ascending Colon. He has also proved, by the use of the Bismuth meal, that the contents of the Colon, below the Splenic Flexure are completely evacuated; as, after defaecation, he observed that the shadow of the whole intestine below the Splenic Flexure disappeared.

When the faeces reach the Anal Canal they are extruded by the action of the Levatores Ani which, as it were, draw the bowel up from the faeces. The External Sphincter then contracts and closes the bowel behind them.

A point which has a very important bearing on many cases of constipation is this, that the desire to defaecate may be resisted by the will, and very soon the sensation disappears altogether, it may be not to return for twenty-four hours. If from any cause, inconvenience, modesty or such like, this voluntary resistance is encouraged, there is, as a result, a blunting of the sensibility of the Rectum and a condition most conducive to constipation is set up.



## PHYSICAL CHARACTERISTICS AND COMPOSITION OF FAECAL DISCHARGE.

As has been said the healthy individual should have one sufficient evacuation in every twenty-four hours. The actual bulk will depend to a large extent upon the character of the food which has been taken; thus there will be much more residue from a mixed-vegetable and proteid diet than that from a diet consisting merely of proteid, carbohydrates and fat.

The passage of the intestinal contents is more rapid through the Colon when the diet has consisted of a large proportion of vegetable than when vegetable has been omitted. The result is that there is not so much opportunity for the absorption of water, therefore the faecal contents are less firm in consistence.

The average daily discharge on mixed diet is from 4 to 6 ounces in weight and should be composed of about 75% water and 25% of solids. (Gant<sup>5</sup>)

The composition of faeces consists of: water, particles of food which are indigestible or have escaped digestion, intestinal juices, mucus and shed epithelial cells and bacteria.

## THE BACTERIA OF THE COLON

At birth, the human intestine is full of meconium and contains no microbes. These, however, very soon make their appearance, from four to seven hours after birth was the earliest that Escherich, who specially investigated the subject, found them. (Sahli<sup>6</sup>)

The average number of bacteria excreted daily in the faeces of a normal person is estimated at 128,000,000,000,000, and their weight, when dried, is 8 grammes. They constitute one third of the human excrement from a mixed diet.

Bacteria are most numerous in the large intestine, amongst the waste materials, and are few in the Small Intestine, the digestive part.

The remains of undigested food and the mucous secretions from the intestines form a suitable nidus for the growth and development of bacteria. Strasburger (Hertz<sup>1</sup>) has shown that in constipation the quantity of bacteria is reduced in proportion to the total weight of dried faeces. Metchnikoff,<sup>7</sup> however, asserts that this conclusion is fallacious as, in such cases, the substance removed after injection of an enema is extremely rich in bacteria.

The majority of the bacteria in the faeces are

dead, those in the water returned after the enema are alive.

The only useful purpose served by bacteria in the bowel would appear to be to help digest such substances as cellulose, but this is not necessary to man, as, by the cultivation of plants of high nutritive value and by advanced methods of cookery, he is able to dispense with the digestion of cellulose. On the other hand, the products of the putrefaction of food residues, which is the result of bacterial activity, may be absorbed and lead to general toxæmia.

#### AETIOLOGY OF CONSTIPATION

We have seen that, in the ordinary course, to maintain the economy in an ideally healthy state we must have regular passing along of the residue of the food and a regular and complete evacuation of the contents of the Colon, from the Splenic Flexure, Pelvic Colon and Rectum, at regular intervals.

In considering therefore the Aetiology of Chronic Constipation it will be best to review the various factors involved in the function, and to

see how deficiency in any one of the, or group of them, affects the process.

The Factors may be divided primarily into:-

- (1) Passenger. i.e. Faeces or Contents of Bowel.
- (2) Passages, i.e. Intestinal Canal.
- (3) Powers    (a) Intrinsic    )  
  ) Muscles.  
  ) (b) Extrinsic    )  
  ) (c) Nervous Mechanism.

- (1) Faults in the "Passenger." (Faeces or Contents of Bowel).

These may be in the nature of:

- (1) Too small quantity.
- (2) Too great quantity
- (3) Too hard and dry consistence, from
  - (a) Deficiency of water
  - (b) Excessive absorption of water from delay in passing.
  - (c) Excessive loss of water.
- (4) Foreign bodies.

- (2) Defects in the Passages may be due to:

- (1) Narrowing or Occlusion of the lumen of the bowel by
  - (a) Organic Stricture
  - (b) Pressure from without
  - (c) Spasm
  - (d) Kinks.

(2) Excessive Dilatation of a part of the  
bowel.

(3) Defects in the Powers may be due to:

(1) Musculature:-

- (a) Intrinsic, involuntary, muscles of the intestine.
- (b) Extrinsic, voluntary, muscles of the abdominal wall, the diaphragm, the muscles of the pelvic floor.

(2) Nervous Mechanism:-

- (a) Cerebral Influences on reflex process.
- (b) Nerves involved in the reflex are:
  - (i) Sympathetic
  - (ii) Spinal.

#### I. FAULTS IN THE PASSENGER:

The faecal contents may be (1) too small, (2) too great, in quantity, (3) too hard and dry and so cause Constipation, (4) Foreign bodies may obstruct.

1. As we have seen already the amount and quality of the food ingested determines to a large extent the quantity and character of the faecal contents of the Colon. Thus, if a person is suffering from starvation, whether this be due to his inability to obtain food or to the presence of a disease, as for instance, malignant stricture of the Oesophagus, or Stomach, which prevents food



being passed into his digestive tract, then, of necessity, there must be a reduction in the bulk of the faecal residue. There would then be wanting that mechanical stimulation which is one of the primary requirements for the peristaltic action of the bowel. The faecal residue would be passed on more slowly and it would take longer for it to accumulate in the Pelvic Colon in such quantity as would create a desire for defaecation.

Again, the constituents of the food have an important bearing upon the character of the faecal residue. The more indigestible, the greater will be the residue. Thus, we have seen that vegetarian diet, owing to its excess of cellulose, is less easily dissolved than animal diet; it also increases the flow of intestinal juices and favours the development of a larger number of bacteria, in these ways also, therefore, increasing the bulk of the faecal remainder.

It has also been pointed out that vegetable diet tends more to the development of those chemical products which, together with the mechanical effect of the bulk of the residue, give rise to local reflexes in the bowel which lead to peristalsis.

2. In the case of individuals who habitually

bolt their food and do not masticate but swallow en masse, the stimulus to the bowel may be insufficient to move on sufficiently quickly the resisting bulk of material; similarly, in children, who are fed on undiluted cow's milk, it happens, at times, that the residual curd is so massive as to cause obstruction to its onward passage at the normal rate.

3. The stools may be too hard and dry and so resist the driving force of the bowel. Several reasons for this may be adduced, e.g. (a) deficient intake of water and of fluids generally, or (b) excessive absorption of fluid. The function of the Large Intestine we have seen is mainly absorptive; whatever, then, may lead to diminished activity of peristalsis will tend to result in dry faeces.

The contents of the Small Intestine, as they are "squirted" into the Caecum are always fluid. The canal becomes narrower the nearer to the Pelvic Colon we go, therefore it gives greater opportunity for absorption, and when the faecal contents arrive at the narrower part of the canal they are firmer in consistence.

4. Anything which increases the secretory functions of the kidneys, lungs and skin, will,

of necessity, rob the intestinal contents of some of their fluid composition. Thus, Diabetes, prolonged muscular exertion, hot weather, tend to result in constipation.

## II. DEFECTS IN THE PASSAGES:

The lumen of the Colon is smaller as it proceeds from the Caecal to the Rectal end, but this is compensated for by the greater muscular development in the wall of the bowel.

Constipation may be induced by an abnormal state of the canal in respect of its lumen. This may be in the nature of (1) narrowing, or (2) dilation.

1.      Narrowing is by far the commoner condition of the two. It may be caused by alteration in the bowel wall itself or by pressure upon the bowel from without.

- (a) The commonest cause of narrowing is organic stricture; this may be malignant or benign in character.

Malignant stricture has its commonest site in the Large Intestine, iliac or pelvic colon, and in the Rectum.

The symptom which calls attention to the condition is frequently diarrhoea, in

a person who has hitherto been of regular habit, or with a tendency rather to constipation. This diarrhoea is apt to be intermittent. It is then a safe rule to examine the Rectum and Pelvic Colon in every case of intermittent diarrhoea, especially if it occur in a person over 40 years of age.

The growth is usually a columnar celled carcinoma.

There may or there may not be blood on the stools and the stools may or may not be altered in shape.

In the softer, papillomatous, carcinoma, which is more in the line of the bowel and not circular, the narrowing does not occur so readily and therefore constipation is not so marked.

Benign stricture need not be discussed here as it is so rare.

(b) Pressure from without.

This occurs so as to effect the free action of the bowels most commonly in that portion of the gut which



lies within the pelvis. Here there is an unyielding bony wall on the one hand and the fixed bowel on the other. Obstruction in this region is more common in women because of the frequent abnormalities in their pelvic-generative-organs. Thus, pressure of an enlarged retroverted pregnant or of a fibroid uterus, or of an ovarian cyst in the pouch of Douglas, would prove an effective cause of troublesome constipation. The pressure exerted by an abnormally placed pregnant uterus is sufficient to cause constipation or sluggishness in the organ, above the pelvis. The possibility of pressure being exerted and of resulting constipation by such conditions as tumours of the kidney, cystic or other, of gall bladder, liver etc., or by abscess, intraperitoneal or extra peritoneal, may be borne in mind, but such cases are not by any means common and would be complicated by inflammatory infiltration of the intestinal wall and by adhesions.

(c) Spasmodic contractions of the Colon is another cause of narrowing of the lumen. This occurs in individuals of nervous temperament. It affects portions of the Colon at a time - a few inches, more or less. It may be brought on by worry or excitement.

(d) Kinks or twists of the bowel. Following upon inflammatory attacks in the Peritoneum or upon surgical operations, adhesions may be formed and traction put upon the intestine.

Most commonly this occurs in the pelvic region and constipation is a frequent and troublesome sequela.

Splanchnoptosis or "Glenard's Disease," as a cause of constipation, will be considered later, under faults in the musculature.

## 2. Dilatation of the lumen of the bowel.

This may occur as a congenital defect, in the condition known as Hirschsprung's disease, or "Congenital idiopathic dilatation of the Colon." So far as one can gather, this is a rather rare condition and, in a paper of this kind, needs only to be mentioned in passing.

Dilatation also occurs as a result of stricture of the bowel, also in rickets, from accumulation of gas in the bowel.

### III. FAULTS IN THE POWERS:

#### 1. Musculature.

(a) Atony of the intrinsic - involuntary - muscles of the intestinal wall.

Weakness of the intestinal musculature is part of a general manifestation. The causes giving rise to it will already have been in evidence in other parts of the economy. Age, acute illness, blood disorders, starvation, the cachexias, all tend to produce constipation by interference with the general nutrition. The muscular fibres and the mucous membrane of the bowels suffer together with the other tissues, with the result that they lose their tone and resiliency; they have neither the vigour nor the reflex irritability necessary to produce strong enough peristalsis waves. In like manner, ~~on~~ in obesity, the infiltration and deposition of fat, in and around the bowel, interferes with its working capacity.

(b) Extrinsic or voluntary muscles.

These consist of the diaphragm, muscles of the abdominal wall and those of the pelvic floor.

By the combined action of these, in health, there is produced an increase in the intra abdominal pressure which assists the onward passage of the faecal contents of the bowel and gives the needed impetus during the act of defaecation. In considering the act of defaecation mention was made of the function of these muscles.

When the desire for defaecation arises, the sequence of events is as follows:- A long inspiration is made, followed by voluntary closure of the glottis; the diaphragm is thus forced downwards; the abdominal muscles then come into action, specially the internal obliques, and still further lessen the intra-abdominal space, increasing thereby the pressure and in this manner the faeces are pressed into the Rectum and even into the anal canal. The distention and irritation thus produced give rise to stimulation of nerve endings which communicate with the lumbar spinal centre and as a result, efferent influences pass to the colon causing peristaltic contractions of its muscular fibres, and in the sphincters, which relax.

The combined action of the diaphragm, abdominal muscles, peristalsis of colon and relaxation of the sphincters results in the protrusion of the faecal mass, and its expulsion.



In emphysematous states of the lungs, as in chronic bronchitis or asthma, the diaphragm may already be pushed lower down than normal and so be put, as it were, out of action, whilst the abdominal muscles, weakened and stretched by excessive coughing, are inefficient.

The abdominal muscles may be enfeebled by old age, as a result of depressing illness or have lost their resiliency from over-stretching in cases of large abdominal tumours or of accumulations of fluid, as in ascites, or of subcutaneous or subperitoneal fat, or they may be insufficient from other and avoidable causes.

In the writer's opinion the abdominal muscles are amongst those which receive least attention in the development of the adolescent. The object of most of the so-called Physical Culture systems appears to him to be to develop the muscles of the extremities and to increase the chest capacity; all very good in their way, but the attention given to the abdominal walls is quite subsidiary. From the writer's observation he believes that the abdominal muscles, in the average individual, are the least thought of and the least exercised, with the result, that there is a lack of tone and a tendency to prominence of the abdomen, due to the

stretching of the weakly parietes by pressure of the abdominal contents.

The erect attitude in man lends itself to encourage this tendency no doubt. There is also a tendency to the deposition of fat in the abdominal wall and this also interferes with the free action of the muscles.

Large abdominal tumours, ascites, excessive accumulation of fat within the peritoneal cavity and childbearing all tend towards stretching the abdominal walls, thinning the muscles, in consequence of which their contractibility is diminished. At the same time the abdominal cavity is enlarged and the increased volume of its contents necessitates a greater degree of force to obtain the increased intra-abdominal pressure required for defaecation. In addition, there may be separation of the Recti muscles which allows of protrusion of the abdominal contents, very marked in "pendulous belly."

A further result of the weakening of the abdominal wall, and one which has some bearing upon the causation of constipation, is that the viscera lose part of their natural support and, in consequence, they tend, one or more, or all of them, to prolapse, leading to the condition termed

Splanchnoptosis or "Glenard's Disease." This tendency is accentuated in women who have been in the habit of "tight lacing;" in such cases the organs are actually pressed downwards.

Authorities, such as Gant<sup>5</sup> and Lane<sup>8</sup>, consider that Visceroptosis is a fruitful cause of constipation, as they say that the prolapse of the viscera tends to cause kinks at the various flexures of the colon with the result that the onward movement of faeces is interfered with; that, as a result of the constant strain on the peritoneal attachments of the depressed viscera, there is set up a chronic inflammatory condition which is protective in so far as it tends to limit the prolapse, but, at the same time, there occur inflammatory adhesions between the coils of the gut and neighbouring organs, thus further increasing the obstruction.

Hertz<sup>1</sup>, on the other hand, says that he can get little or no evidence of delay in the onward passage of faeces in cases of visceroptosis; indeed, he has found in perfectly normal subjects, in the erect attitude, that the angles at the splenic and hepatic flexures are as acute as in any case of visceroptosis and yet give rise to no trouble. He holds that visceroptosis and constipation in the cases quoted by such authorities are really due to and are in

consequence of weak abdominal muscles.

In connection with the muscles of the pelvic floor, the main cause of default lies in the stretching and tearing with loss of tone, which are the results of the second stage of labour. The Levatores Ani are the most important structures in this connection.

Regarding the External Sphincter, it is to be remembered that the condition known as Anal Fissure, which consists of a crack in the mucous membrane extending down to and exposing the nerves of the sphincter, thereby causing a spasmodic contraction of the muscle, is at once a result and a cause of constipation. Thus, the passage of scybalous faeces is liable to stretch and tear the mucous membrane or scratch it; but, on the other hand, if there be present such a tear or scratch, the passage of faeces over it causes pain so exquisite that the individual so afflicted is in dread of the necessity of evacuating the bowels.

## 2. Nervous Mechanism.

(a) Cerebral influences on the reflex process.

As has already been pointed out, the action of the bowels is largely influenced by mental states. Thus, excitement or fear may be followed by diarrhoea, and anger result in constipation.

Constipation is a common concomitant of



insanity and is one of the complications which has to be carefully watched.

In insanity and in the milder, functional, forms of mental insufficiency, such as neurasthenia and hypochondriasis, this feature is due from the associated depression of the nervous system, to diminution in the response to the stimuli which normally excite intestinal activity.

Constipation may be brought about, and very commonly this is the case, through ignorance, or neglect of or voluntary resistance to the call of nature.

, As has been shewn, the most powerful stimulus to peristalsis of the colon is the entrance of food into the stomach. After a night's repose, the sensations are more acute, and it therefore commonly happens that the call to defaecate is more distinct after the morning meal. If one voluntarily resists this, or for one reason or another, allows the opportunity to pass, then the likelihood is that the consciousness of need for defaecation becomes less persistent and a condition of constipation is set up, in the course of time. On the other hand, one may encourage a healthy evacuation, and even arrange for its daily occurrence, even timing it to an hour, by allowing nothing to interfere with the duty on its first demand.

(b) Nerves involved in the reflex are:

- i. Sympathetic. In affections of the abdominal sympathetic there may be severe constipation.

Some people appear to have insensible nerve terminals. This condition exists in very young infants, in whom defaecation is purely a reflex act, and results from insufficient excitability of the nerve terminals, so that the stimulation of the nerve centre is insufficient to produce the necessary reflex.

In adults, unless in the case of the aged, in whom the excitability has diminished, with failing powers generally, the lack of excitability is due to neglect of regular evacuation, whereby faeces have been allowed gradually to accumulate and to be retained. The discomfort at first felt is, by degrees, overcome, until even the presence of a very large accumulation fails to cause any desire for defaecation.

ii. Spinal Nerves. Constipation is extremely common in disease and injury of the Spinal Cord, and is often greater than can be accounted for by the mere loss of power in the abdominal muscles.

If the volitional path in the cord is interrupted above the lumbar centre, the will no longer controls the reflex process.

If the disease of the cord also involves the sensory tracts, the patient is unaware of the action of the bowels, or of the discomfort, and constipation results.

If the sensory portion is unaffected, the patient is aware of the process but cannot control it, but as voluntary action is now out of court, constipation results.

## T R E A T M E N T

As has been said, it is difficult to give an absolute definition of Constipation.

For the purposes of the present paper, the features which, in the main, constitute constipation are, as to time, infrequency of action, and as to character, too small or too hard faeces.

We may take it as the ideal that the bowels should act once daily, preferably in the morning.

Constipation affects both sexes but it is far more prevalent amongst women and children. The reason for this probably lies in the regularity, larger amount of food taken and the more energetic life lived by men; delicacy of feeling in women may be a reason for delaying to attend to defaecation till a more convenient season.

Whilst we have seen that constipation may be associated with or caused by organic disease of, or outside of the bowels, the great majority of cases are due to some functional derangement of the intestinal canal.

### PROPHYLAXIS:

Constipation is a symptom, not a disease, but it is associated with evil consequences, at times so clamant, that it were well to note such general



principles as may, by their adoption, prevent or mitigate the condition.

There is no doubt in one's mind that much ill health and suffering could be avoided in this particular relation were serious attention given to Food, Exercise, and General Hygiene.

1. Food. As has been already noted, the food of the present day tends to be too concentrated, to be freed of the bulky and indigestible elements, and the refinements of cooking still further reduce the efficacy of the food residue to stimulate bowel action.

This has been interestingly illustrated in the experience of the writer, in a practice including town and country. It is a matter of very frequent occurrence, as indeed it must be to every practitioner, that he is consulted by young women, in domestic service, who have been born and bred in the country, because they are suffering from indigestion or anaemia, associated with pronounced constipation. It is quite exceptional for him to have to prescribe for this condition amongst those in agricultural employment. Various factors may explain this contrast, such as the active physical toil or the abundance of fresh air enjoyed by the latter class, but, in the writer's opinion, the main reason for the difference lies in the more

simple dietary, the absence of co-called luxuries, such as are so convenient to town dwellers. It is to be regretted, however, that with the more ready conveyance of commodities, there is even now a very perceptible change in the cottar's dietary, which is not to his advantage.

There is less oatmeal in the form of porridge and oat-cakes and more noxious bread consumed than used to be the case, whilst tea enters largely into the bill of fare, both of children and adults. Another factor is in the defective teeth of young women; this is in all probability due itself to defective and vicious nourishment, and it, without doubt, leads to imperfect mastication, indigestion and constipation. Oral Sepsis has only of recent years become recognised as a fertile cause of ill-health. People of this class appear to look upon artificial teeth as adornments and not from the sanitary and utilitarian point of view, with the result that a large proportion are content with having an upper set, as being most in evidence, without any opposing "grinders" in the lower jaw, provided there still remain a few presentable lower incisor teeth.

2. Exercise. During the past twenty-five years such strides have been made in mechanical locomotion that the present generation has never

developed the healthful exercise of walking, which, previous to the invention of the now ubiquitous bicycle and motor car, was the recognised method of progression.

Some authorities recommend bicycling as a remedy for constipation, the writer cannot satisfy himself from experience that it is especially beneficial in this direction. Walking over uneven or hilly ground or riding are par excellence the most healthful and stimulating exercises in relation to constipation. Out of door sports, rowing, football, golf, swimming and suchlike are to be highly recommended in appropriate cases, not only because of their beneficial effect on the economy generally but also for their stimulating effect on bowel action, directly or indirectly.

Gymnastics, and more especially Swedish exercises, are greatly to be advocated. The writer's experience of the latter, both personal and in his practice, has confirmed him of the great benefit which results from systematic practice of such movements. In several cases of pronounced neurasthenia, with obstinate constipation, by carefully graduated courses of such treatment, the results have been most encouraging.

Particular attention should at all times be

directed to those exercises which tend to develop the abdominal muscles, and which, in their performance produce a massage of the abdominal organs. By bracing up the abdominal muscles we prevent to a large extent the tendency to visceroptosis. In this connection, it were well if girls did not wear corsets too early, if at all, as these are only, at the best, artificial and do away with the active, vital, support of the abdominal walls.

### 3. The formation and maintenance of a regular habit of evacuation.

From the earliest infancy the child should be trained to evacuate the bowels by being regularly held over a receiver. It is remarkable how easy it is to teach an infant and how quickly a habit is formed by this plan.

It would be well were parents to continue to impress the importance of habit in this function upon the minds of their growing children and to explain the dangers which are imminent through its neglect.

By habit, the act could become, to some extent, in health, a rhythmic process, occurring at a fixed time each twenty-four hours.

Amongst the poor, lack of proper sanitary accommodation is a factor of no small importance and



one which has to be reckoned with.

With regard to the most suitable position in which to defaecate, it is to be noted that the modern seat is too high. It should be arranged at such a level as will allow of flexion of the thighs upon the abdomen, in this posture there is support given to the muscular walls by the apposition of the thighs and the effort of expulsion is assisted thereby.

The natural attitude, such as is assumed by uncivilized races, is one of crouching, with the knees bent up towards the chin; it is an approximation to this position which should be aimed at. Professor Chiene exhibited, some years ago at a meeting of the Edinburgh Branch of the British Medical Association, a model of his own devising, which he called a "Kata-physical closet;" this, by reason of its being low set, and having the sides well raised, caused the occupant to assume, approximately, the attitude to which we allude.

In some persons the bowels act at night, but in the majority the tendency is for evacuation to occur in the morning. Every encouragement should be given to ensure this morning action by going at a fixed hour. Nothing should be allowed to interfere or to cause it to be put off. If no stool should be passed at the time, a second visit should

be paid later. Even though there be no desire, it were well to endeavour to create one by visiting the closet every morning at the same hour.

In all cases, and in particular in women, it is important when one enquires as to the state of the bowels, not to be led astray by the reply, so often given, "quite regular." It is necessary to know how often the bowels act, what the consistence, appearance and quality of the stool is, and whether it is a natural evacuation or the result of previously taken medicine.

Even with all care, how often does one find that, in spite of apparently well considered replies to one's queries, what has been called a regular and satisfactory relief, is only the overflow of a full colon, as may be proved by washing out the bowel; the amount of the excreta is not equivalent to the residue of the food taken but leaves a portion to which has been added the waste of succeeding meals, this going on day after day tends to an increasing column of faecal matter which, by its long residence in the colon, becomes dried up and hard, and leads to various discomforts and trouble. This condition has been called "Fragmentary Constipation."

In other cases patients complain that they have diarrhoea and, on examination, it is found

that this is secondary to the impaction of constipated matter, which, by causing hyperaemia, increases secretions, liquifaction of faeces, an abnormal production of gas and an accentuation of peristalsis. The secretions from the bowel, with some liquid faeces, pass over without disturbing the scybalous masses, give rise to diarrhoea and mask the true state of affairs.

In considering the treatment of each case in which constipation is a salient symptom, one's first duty is to endeavour to diagnose the primary cause, for in this way only can one decide whether the patient requires local or general treatment. Just as there are many causes of constipation, so the line of action in the treatment of the condition varies. Careful enquiry into the history of the complaint is necessary in order to eliminate the possibility of the existence of serious disease in other symptoms, which might be the primary cause of the condition. That the central nervous system exerts a powerful influence over intestinal motility is already shewn by the frequency of chronic constipation in psychic disorders, e.g. melancholia, neurasthenia, as well as in many diseases of the brain and spinal cord, e.g. meningitis, epilepsy, tabes. The effects of poisons, such as morphia

and lead, are also manifested in part by constipation. Acute specific fevers need not here be more than mentioned.

It is sometimes of value to find out what delay, if any, there is in the passage of the food residue. As we have seen, delay does not usually occur until the chyme reaches the great intestine and chiefly there, in the pelvic portion.

Hertz<sup>1</sup> classifies constipation into:

(1) Retention of faeces above the pelvic colon, i.e. descending colon below the crest of the ilium, including the Sigmoid Flexure.

(2) Retention in the pelvic colon, where expulsion is difficult or impossible, owing to weakness of the muscles of defaecation or to impairment of the defaecation reflex. To this class of constipation he has given the name "Dyschezia."

In order to ascertain what delay there is and where it occurs, Hertz<sup>1</sup> gives a meal consisting of bread and milk, containing 1 oz. of Oxychloride of Bismuth and traces, by means of the shadow given by the bismuth on the fluorescent screen, the progress of the food along the alimentary canal.

Dr. George Herschell, London,<sup>9</sup> suggests a simple method whereby the General Practitioner, who is beyond the reach of Radiography, may diagnose the two groups. He gives a test meal in conjunction with



a dose of Carmine. If this found in the stool next morning the time of transit is normal; if stool passes with no carmine delay is in upper colon; if no stool is passed, a small injection is given, sufficient only to empty the pelvic colon, if this brings away carmine coloured stools, the delay is in the pelvic colon. It would be necessary to anticipate Dr. Herschell's experiment by making sure that the bowels had already been well emptied.

Having cleared up the position so far, it is well to ascertain the habits, as regards the kind and quality of food and drink, of the patient.

Treatment may be divided into:

1. Educational and Prophylactic.
2. Dietetic.
3. Mechanical.
4. Medicinal
5. Surgical.

1. EDUCATIONAL AND PROPHYLACTIC - see page 39.

2. DIETETIC:

A careful selection of the daily dietary, with a few directions as to proper exercises and as to the formation of a regular habit, suffice to cure many cases of constipation. In others such measures must be combined, for a time at least, with further treatment, such as mild purgatives, massage, electricity. Other cases again require some surgical interference

to bring about cure.

In those cases which are due to the slow passage of food residue along the large intestine, owing to deficiency of bulk of fluid, dietetic treatment is of the greatest value.

Delay may be due to a too complete absorption of food materials, in which case an increase in the less digestible constituents is indicated, in the form of vegetable cellulose. A diet of plenty of fruit and vegetables will relieve a great many patients. A patient of the writer's who suffered greatly from constipation, acne, indigestion and headaches, went this summer to stay with friends in France. Whilst there, her diet consisted very largely of vegetables and fruits - the vegetables being freely cooked in butter - very soon she became aware of improvement in her digestion and in the other symptoms, and when she presented herself, on her return, the change for the better was most marked. The skin was clear, free from all signs of acne, body weight had gone up, constipation was quite unknown and the general health better than it had been for years.

Agar agar, a gelatinous substance obtained from certain sea-weeds, has been used in such cases. It has the property of absorbing water readily and of retaining it. It passes practically unaltered

into the intestine where it adds to the bulk of the faeces and, by keeping them uniformly moist, prevents the formation of scybalous masses; it also assists peristalsis. It may be given in mashed potatoes, porridge, or with cream; sugar or salt may be added according to taste. A few years ago, the writer had a case of dementia, in which constipation was very troublesome.

The lady was obsessed with the idea that she could not, or should not eat in quantity, she also had the utmost dread of any form of drug, the result was that, in addition to growing very thin, she suffered from severe constipation, with many of its attendant ills. She was given Agar agar in soups and other articles of diet and, so long as she could be prevailed upon to continue its use, the result was most satisfactory.

Certain food stuffs have a beneficial effect on chronic constipation by a judicious varying and combination of these great benefit accrues in many instances. Such articles of diet as oatmeal, brown bread, honey, treacle, many jams, marmalade, also fats, butter are valuable. So also are fruits, such as apples, pears, oranges, figs and prunes; vegetables, such as cabbage, potatoes, spinach, onions and brussels sprouts.

White bread is contraindicated as so much of the gritty substance of the wheat has been removed in the process of manufacture of the flour; so also tea, unless China, weak and freshly made. Ceylon and Indian teas contain a greater proportion of astringents.

Sweet milk is a constipating food, as is seen in bottle-fed babies, but if there be added, in correct proportions, some cream, the bowels can be regulated quite well, as a rule.

The writer has quite undoubted good results in some cases of constipation with excessive flatulence, intestinal, from the use of Soured Milk, containing an active culture of Lactic Acid Bacilli, devised by Metchnikoff, such as is obtainable from Messrs Le Ferment of Paris, in the form of tablets or powder, of Lactobacilline. In some persons this milk has given rise to stomach irritation, but such persons could not take milk in any form without discomfort.

Where there is dyspepsia coincident with constipation it is necessary to treat the former by a diet suitable and, if need be, to relieve constipation by drugs in the meantime. It may be that, with the cure of the dyspepsia, the constipation will be relieved.



A plentiful supply of good, not too hard, water should be allowed to children and adults alike. This, to a large extent, is absorbed in the course of the digestive canal and is used up in the formation of the various secretions of the body, including the digestive juices.

If the fluid taken is hardly sufficient for the needs of the tissues, it is likely to be absorbed very completely from the intestines, hence the material in the colon becomes hard and dry and is passed on with difficulty.

Fluid taken into an empty stomach is passed rapidly on to the small intestine and, if it is empty, as is usually the case in the early morning, it is probable that some of it reaches the colon with little delay and this may account for the easy evacuation which is so often found to follow an hour or so after drinking a tumblerful of water on rising. It is likewise advantageous to make a practice of drinking a tumblerful of water, preferably warm, before retiring.

The constipation which follows severe and prolonged exercise may be ascribed to deficiency of body fluid owing to free perspiration, as well as to fatigue.

### 3. MECHANICAL:

Sedentary occupations conduce to a constipated habit. Those whose avocations entail physical activity, as for instance, agricultural labourers, shepherds, suffer very little from costiveness.

Exercise, by stimulating the circulation, encourage the elimination of waste products by the various channels of excretion, skin, lungs, kidneys; increases the secretory functions generally, and, in particular, those of the digestive tract, and improves the tone of the musculature, skeletal and intestinal. It induces deep breathing and thereby causes a freer action of the diaphragm with, in consequence, a certain amount of massage-like effect upon liver and transverse colon. The whole being is re-created and body and mind and stimulated.

To be thus beneficial, exercise should be methodical and regular; it should be well balanced, no one part being developed at the expense or to the neglect of another. It should be taken away from meals, and should never be conducted to the extent of producing over fatigue. Competitive exercise is not so desirable, as it is apt to lead to overstrain.

In the list of what may be called General Exercises may be included walking and climbing,

horse exercise, swimming, tennis, football and such like. These act through their mechanical effect directly upon the alimentary tract and indirectly through the improvement in the blood circulation which is manifested in all parts of the body.

While out-of-door exercise may not be immediately available to many city dwellers, it is within the power of all to institute, in their own homes, systematic physical training; this has proved in the personal experience of the writer and of many of his clients of great service in overcoming the tendency to constipation.

Specially to be commended is the adoption of what may be called medical gymnastics, of which there are numerous well accredited systems. These are specially valuable if pursued before the morning bath and again, if possible, in the evening before retiring.

They consist in various movements, such as trunk-twisting, trunk-bending; lying in supine position raising the limbs and flexing the thighs on the abdomen; keeping trunk erect standing on tiptoe, hands on hips and squatting, with knees outspread. Throughout careful attention must be given to deep breathing.

The effect of such exercise is to develop

and tone up the abdominal walls and so give support, which, in such conditions as ptosis of the viscera, is so desirable and helpful; at the same time, by their mechanical effect, they produce an alternating pressure on the abdominal organs, increasing the intra-abdominal pressure and so by a massaging influence stimulate peristalsis. Similarly, systematic deep breathing increases the range of diaphragmatic action, thereby lessening the intra-abdominal space and increasing the pressure on the contained viscera.

The operations of a skilled masseur (or masseuse) are of the utmost value in many cases of atonic constipation. The movements then are directed to and in the line of the colon, beginning over caecum continuing along ascending, transverse and descending colon. They should be of a kneading character. By such means, peristalsis is stimulated and accumulations of faeces, which otherwise resist the feeble attempts of the muscular contractions of the unaided bowel, are caused to be displaced and are moved onwards.

Massage of a firmer character may be directed towards the strengthening of the abdominal walls.

Auto-massage may be practised with a rubber ball, filled with No. 8 shot, to the weight of 4



lbs., for an adult, half that weight for a child.

This is used by the individual whilst in the recumbent position; the ball is rolled over the course of the large intestine, from caecum to descending colon; ten minutes of this night and morning is sometimes quite efficacious.

#### 4. MEDICINAL:

Indiscriminate use of drugs for the purpose of producing evacuation of the bowels is to be severely deprecated. As we have seen very many cases can be cured by attention to the hygiene of the bowel, varying of the diet, or by systematic exercise of an active or passive kind.

Any one or any combination of these three primary lines of treatment will be satisfactory in a large proportion of cases.

There are, however, without doubt, classes of constipated individuals who require help of some kind beyond these. For example, in the constipation which occurs in cases of inoperable cancer, as a concomitant of incurable disease of the kidneys, in chronic heart disease or in diabetes, drugs have a very necessary and useful place in one's armamentarium. Similarly, in the constipation of old age, some form of laxative is of advantage.

It is to be regretted that in practice, where chronic constipation is of such common occurrence, and one is so frequently called upon to advise, it is so difficult to follow up results. Patients are given the directions or the remedy which is considered most suitable to their respective type of constipation, the results may be satisfactory for the time being, and with that they are satisfied. There is not opportunity for really estimating results from the standpoint of continuity, as there may be no further consultation till the condition recurs, which it probably will do owing to the neglect or lack of intelligent interest, so, at least is it amongst the working class population.

There are, too, so many and so many various remedies on the market, which are easy of access and which are lavishly commended to the public fancy, through the medium of advertisement, that the physician may find himself only the dernier resort in cases which have, by unintelligent drug-ging, complicated the condition for which relief is requested.

It is to be remembered that the rapid passage through the whole alimentary canal must result in a considerable loss of nutritive material. It is

therefore essential to order the smallest dose of an aperient which will give daily, formed, motion and to instruct the patient to diminish the quantity used as improvement in the condition of the bowels occurs. (Hertz, Discussion on Constipation and its treatment, in the Brit. Med. Journal 1910<sup>10</sup>).

Constipation may be due to very various causes and the choice of the drug, the dose and the duration of its use depend largely upon the cause.

In habitual constipation, each case must be treated on its own merits and individual idiosyncrasies carefully studied. "Though the symptom is a simple one, its treatment needs not this drug nor that drug, but any drug or many drugs, or no drugs, combined with systematic measures for gradually restoring the healthy functions of the digestive tract that culminate in normal defaecation." (Practitioner)<sup>11</sup>.

Thus if spasm or obstruction be the cause, purgatives, which increase spasm or peristalsis are out of court; in such cases sedatives are indicated, in the first instance.

It would be manifestly unwise to prescribe a strong purgative medicine, at all events at once, if it were found that the patient suffered from marked impaction of faeces. Similarly, persons

suffering from chronic constipation, complicated by some painful affection of the anus, should take such a laxative, both on rising and on retiring, as will promote soft, small motions, and avoid the pain incidental to one large hard passage.

It is then necessary to ascertain whether the case to be treated is one of the - I. Atonic, Habitual, or of the II. spastic variety, or of the nature of what Hertz has termed III. "Dyschezia."

- I. In the treatment of chronic atonic constipation it is wise to avoid severe measures. What has to be aimed at is a toning and stimulating effect upon the whole body of structure, and with this, an increase of the activity of the intestinal musculature and gland elements.

Of drugs which act favourably in these directions and particularly on the large intestine, we mention a few as of special value and in common use.

Cascara Sagrada is probably the most commonly prescribed laxative. It is best administered in small and repeated doses. It has a definite and tonic action on the non-striated muscle and glands of the intestine and it is slightly stimulating to the liver. Good samples have the advantage that



the dose is small and that, though taken over long periods, there is, in many cases, no need to increase the dose; on the other hand, it is frequently possible to gradually decrease the dose, a healthy habit of action having been established. It causes little or no griping or discomfort. The writer has a patient who has taken Cascara since it was first introduced and in all these years, has only increased her original doses by five minims of the Liquid Extract three times a day. She assures me that no remedy she had tried before had been thus efficacious. Its only objection is its unpleasant taste, but this may be overcome, to a large extent, by admixture with flavouring agents, as in the combination known as Cascara Evacuant. A very favourite and effective prescription is one containing Cascara, Nux Vomica, Belladonna, and flavouring agents.

Castor oil, in small doses, is a safe and mild remedy. Encapsulated in whiskey or in orange juice its nauseous taste is not observed. It passes the stomach unchanged and is split up and saponified by the biliary and pancreatic juices; a part of it escapes unchanged to the large intestine and acts as a lubricant. It is

very useful, in regular doses night and morning, in the constipation of old age and, in larger doses, for the removal of faecal masses.

Senna is a favourite remedy of the writer's, who has found it very efficacious, in the form of a watery extract of the pods. Six to twelve pods are covered with water and allowed to steep over night, the liquid is drunk in the morning and the bowels are moved in about four hours. It has practically no taste.

Aloes and its active principle, aloin, are amongst the most commonly prescribed remedies, most usually in pill form. They act exclusively on the large bowel. They are contra indicated in Haemorrhoids, because of the hyperaemia of the Rectum which results.

Podophyllin is useful as a cholagogue cathartic. It should be given in small doses, as, otherwise, it is apt to purge too severely. It is slow, ten to twelve hours, in action. On account of its griping tendency it is best combined, in pill form, with carminatives, such as Hyoscyamus, Belladonna or Cannabis Indica.

Sulphur, precipitated or sublimed, or combined with Cream of Tartar, to form the officinal confection, is a very favourite remedy in cases of Haemorrhoids and Anal Fissure. In such cases, sulphur

renders the motions of soft consistence which pass over the tender area, without causing unnecessary pain.

Drugs, such as the following, are frequently combined with laxatives: Strychnine, for its general and tonic effect; Belladonna and Hyoscyamus, to combat spasm and to prevent griping; Capsicum to stimulate gastric secretion; Asafoetida, Myrrh and Oils, such as Peppermint and Cajuput, to relieve flatulence.

Saline purgatives furnish ready means of increasing the liquidity of the motions and their frequency.

Contrary to the generally accepted belief their action would appear to be an indirect one. Hertz<sup>1</sup> (p.278) experimented by giving a saline purgative in water along with Bismuth Oxychlorine, before breakfast. Skiagraphic examination showed that the salt only reached the Caecum in four hours, along with the Bismuth, although a watery motion had already been passed  $2\frac{1}{2}$  hours earlier. Hertz was fortunate in having two patients with fistulae in the end of the ilium, whom he used as controls, examining the stools, as passed through the fistulae. Analysis of the watery stool did not show any increase of the salt, and, of the second action,

though there was excess of the salt, yet there was no tendency to its being watery. He found that one half of the salt was excreted by the kidney within 8 hours of its being swallowed, and that the greater part of the remainder was present next day in the stool which was solid.

He concluded that the salt is absorbed by the small intestine and acts, through the blood stream, on the neuro-muscular mechanism of the colon, producing increase of motor and secretory action.

Magnesia and Soda, in the forms of sulphates, are present singly or together, in the numerous natural aperient waters. Those waters with a preponderance of salts of sulphate of soda over magnesia, such as Marienbad or Carlsbad, are probably the best to prescribe, in most suitable cases, as being less irritating to the mucous membrane.

Salines are best given in the morning, before breakfast, and with a good volume of water. They have the advantage of not hastening the contents of the stomach and small intestine, and thus do not interfere with their proper digestion. They are indicated in cases of arterio-sclerosis, in constipation occurring in the obese and in the numerous individuals who suffer from toxæmia from absorption from the bowel, such as occurs in gout



and rheumatism.

A useful method of prescribing such a saline as Carlsbad is to give the following directions:

Stew one dozen prunes, put in a tumbler and add so much water as may be necessary to fill it, add one third to one half teaspoon of the salt; allow to stand for twenty four hours and drink early in the morning; the prunes should be eaten also. This method has the advantage that a smaller dose of the saline is required.

II. Constipation is a symptom associated with muco-membranous Colitis. This disease occurs in persons of highly nervous temperament. It is accompanied by pain, most commonly in the left iliac region, but often spreading over the abdomen also. The stools are small and piecemeal and are coated with mucus, while there are frequently present large shreds or coats of the bowel of various lengths, composed of inspissated mucus.

Tenesmus is common and frequently there is an unsatisfied desire to defaecate. There may or may not be ulceration of the intestinal mucosa.

The pain is due to spasmodic contraction of the bowel, caused by irritation by faeces of the tender and inflamed, it may be ulcerated, mucous membrane, or it may be, by traction of adhesions

between the bowel and neighbouring organs.

In the writer's experience, mucous colitis has occurred much more frequently in women than in men, and in the former, it has practically always been associated with some morbid condition of the sexual organs, such as a tender, enlarged ovary or definite adhesions between ovary and bowel. What relation the ovary really has to the condition, or how exactly the adhesions produce such effects, he cannot say, but, from experience of several cases, he has satisfied himself that there is a casual relation.

In the milder degrees of this condition, treatment consists in the avoidance of purgatives; the administration of Belladonna, or small doses of Morphia; the careful regulation of diet and attention to the surroundings and hygiene, abundance of open air and a mild sunny climate. The bowels are moved by enemata of sterile water or of normal saline, and local application of warmth, in the form of poultices, such as linseed or Antiphlogistine.

The more severe cases come into the hands of the Surgeon, as we shall find later.

III. Hertz<sup>1</sup> groups together, under the name "Dyschezia," cases in which, while there is no delay in the passage of the faeces along the intestine, the act of defaecation fails to expel completely the contents of the bowel beyond the Splenic Flexure.

He explains that it differs from other forms of constipation in that more or less considerable quantities of faeces are found in the rectum, whenever an examination is made, even though immediately after defaecation.

Dyschezia, he says, is due to (1) inefficient defaecation from:-

- a. Habitual disregard of the call to defaecate, leading to loss of the defaecation reflex and atony and paresis of the musculature of the rectum and pelvic colon.
- b. Inefficiency of the voluntary muscles of defaecation, e.g. in Splanchnoptosis.
- c. Unsuitable posture during the act.

2. Some obstacle to efficient defaecation, such as spasm of the Sphincter Ani in anal fissure or painful haemorrhoids; stricture of rectum or anus, commonly malignant; pressure on rectum from

without, of tumours, such as ovarian cysts, fibroids, pregnant uterus.

In such cases as these drugs are contraindicated, at least, until the accumulations of faeces, which have become hard and dry, have first been removed. The best way to accomplish this is by enemata.

Enemata may be divided into two classes:-

(1) high and (2) low; according as the fluid injected is carried into the descending colon and beyond, or only into the rectum, and pelvic colon.

In order to administer a high enema, one passes a long rubber tube beyond the pelvic colon. This is done by taking a short grip of the tube, and insinuating it with a screwing movement. Considerable care and experience is required in order to ensure the passage through the sigmoid flexure, indeed, in some cases, it is not possible even with a stiff gumelastic hollow stem.

Two to three pints may be injected; this should be done slowly by means of a funnel or douche can set at a height of not more than three feet.

Low enemata are given by Higginson's syringe and need not consist of more than from a pint to a pint and a half, as should there be any hard faeces



lodging in the pelvic colon or rectum, little if any, of the water would reach beyond the rectum.

The temperature of the fluid injected is usually a little above blood heat, but in cases, in which a tonic action on the rectal mucous membrane is desired, as in Haemorrhoids, the fluid may, by preference, be cold.

Various fluids may be used, of which sterilised water is the most common, alone or with soap-suds or as a normal saline solution.

Irrigations of the colon with sterile water or with normal saline are soothing and very valuable in the treatment of muco-membranous colitis, in spasmodic constipation, with or without ulceration.

Distension of the bowel is a powerful stimulant to peristalsis and enemata accomplish this, while at the same time they tend to soften the faeces.

Soap added to the water causes stimulation of the mucous membrane.

Oil may be injected prior to the soap and water. It has the effect of lubricating the mucous surfaces, and softening the surface of the faeces as well as of separating in this way the scybala which may be clinging to the bowel wall.

The writer can speak favourably also of enema-ta composed of oatmeal gruel.

Where a more powerful stimulation of the defaecation reflex and rapid effect is desired Glycerine as a suppository or in fluid form, alone or incorporated with the water enema, may be used. Glycerine acts through its dehydrating power. It is useful in Dyschezia due to loss of defaecation reflex.

A formula which the writer has found very useful is well known; it consists of Hendry's Solution  $1\frac{1}{2}$  oz., Glycerine  $\frac{1}{2}$  oz., Water 2 oz. This has the advantage of being small in bulk, and powerfully stimulating. As a rule there is a stool within a few minutes of injection. This formula is particularly useful after abdominal operations, such as Appendectomy. Glycerine is too irritating for use in fissure in ano or in the treatment of constipation caused or accompanied by haemorrhoids.

## 5. SURGICAL.

There are certain cases in which surgical aid will prove of value in the treatment of chronic constipation, according as the fault may lie with the "Passenger" the "Passages" or with the "Powers."

1. Those in which there is such impaction of accumulated faeces in the rectum and pelvic colon, as from experience of similar cases, should not or could not be relieved by purgatives or milder remedies.
2. Those in which there is obstruction to the passage of faeces owing to:
  - a. Excessive dilation or
  - b. Narrowing or occlusion of the lumen of the canal.
3. Certain conditions in which the musculature is at fault.

1. It has been one's experience on several occasions to have recourse to "digging out," with the aid of the finger or the handle of a spoon, masses of excessively hard faeces, which have accumulated in the rectum. This has always occurred in the case of aged persons. One case, that of a bed-ridden man, aged 84, occurred lately. Responding to an urgent message one found the rectum absolutely packed with faecal matter, the rounded lower end of which could be seen through the bulging anus. In the left side of the pelvis was to be felt a hard doughy mass,

extending above the pelvis and towards the middle line. There was no possibility of remedying the condition until the presenting rectal contents were removed piecemeal. The operation required some little force, as the mass was so very hard. When at length the rectum was emptied, Nurse administered repeated enemata through a long rectal tube and gradually the pelvic tumour disappeared, as successive enemata brought away more and more of the partially softened and fragmentary stools. There had been no motion whatever for ten days, although the patient had eaten with abundant relish. The stools had for long previously been small in amount and hard in consistence, yet the patient had had no pain, only a feeling of discomfort and of fulness at the anus.

The reason for the urgent message was the appearance seen at the bulging anus. This was, of course, a case of gross neglect and ignorance, but it illustrates a common enough condition of old age, in which there is "Dyschezia" from loss of the defaecation reflex: the voluntary muscles were, in one so aged, very feeble and the recumbent position added to the difficulties of the patient.

2. (a) Excessive dilatation of the lumen of the bowel is a comparatively uncommon occurrence of



chronic constipation, if we except those cases in which there is dilation following upon paresis of the gut in, say, peritonitic conditions.

The writer has a patient, man, aged 35 years, who, as a boy, received a far from euphonious nickname on account of the extraordinary prominence of his abdomen. He came under the writer's notice some six years ago when he had a very serious attack of obstruction of the bowels. He had extreme pain and vomiting and could not, by medicine or by enemata, get relief of faeces. The abdomen was distended along both flanks and across the front, especially towards the left lower portion and there was evident peristalsis; the middle portion of the abdomen was comparatively soft, though distended. The rectum was empty. The patient had suffered in former years and at intervals from somewhat similar attacks, though never so severe. As the condition was very acute, he was, in this instance, sent to Hospital, where at length, after repeated injections through a long tube, the immediate condition was relieved, after this, however, the colon could be distinctly felt and constipation still recurred, so that it was determined upon to operate. The writer was present at the operation. When the abdomen was opened, an

enormously dilated organ presented at the mesial wound. The Surgeon remarked: "What say you to this being the stomach," so unlike any other organ was it. On fuller examination, it was found to be the enormously dilated descending colon, with wall of great thickness; there were no faecal masses to be felt, the contents had been removed by repeated high enemata and there was only a little soft material to be felt on pinching up the gut. The dilatation extended from the end of the pelvic colon upwards and along part of the transverse colon, but was most marked in the pelvic and lower portion of the descending colon. There was no evidence, the Surgeon said, of any definite stricture in the sense of band or thickening. He expressed the opinion that it was a case of congenital dilatation. The bowel was brought up and stitched to the abdominal wall, the purpose being to make an opening into it through which to wash out the bowel subsequently, and possibly to remove any kink which might exist when the bowel was full of faeces. Unfortunately the attachment did not hold and the bowel tore away from its moorings, so that nothing of the kind was done.

The patient was sent home and since then he has kept well by a daily high injection of a pint

of olive oil and the regular use of cascara and strychnine. He tells me that there is no discomfort so long as this treatment is regularly continued. He is able for his duties as a farmer.

The writer believes this to be a case of Hirschsprung's disease ("congenital idiopathic dilatation of the colon"), though according to writers such cases are not recorded beyond the age of thirty.

In cases of severe atonic constipation which have resisted medical treatment and in which the whole of the colon is much dilated and sacculated, so that there is inadequate emptying of its contents and auto-intoxication is occurring, Appendicostomy may be performed as a temporary measure. By this means, the colon may be regularly flushed out through its whole length, absorption be prevented and the bowel may ultimately regain its tone and efficiency. The writer hazards the opinion that a permanent appendicostomy of this kind might after all have been adopted in the case he has just quoted; by such means the contents would have been removed from the colon with greater ease than is the case now.

The writer has had experience of only one

case in which this operation was done in the treatment of mucous colitis. The result was not so satisfactory as are those frequently reported in literature.

(b) Narrowing or occlusion of the lumen of the bowel is by far the most common and important condition which, giving rise to chronic constipation, necessitates the intervention of Surgery.

The lumen of the gut may be encroached upon by:

1. Organic stricture
2. Pressure from without.
3. Spasm.
4. Kinks.

1. Organic Stricture in the Great Intestine is by far most commonly due to growths of a malignant character in the bowel wall. The sites of election are, in their order of frequency: Rectum, pelvic colon, caecum, hepatic and splenic flexures, transverse, descending and ascending colon.

When such occurs above the pelvis, the operative treatment consists of removal of the section of the bowel affected, with the tumour, when possible, or in short-circuiting the bowel where the relations and adhesions of the growth render removal impossible.

When the tumour is in the pelvic colon, the



portion of bowel, in favourable cases, may be excised through a mesial incision, a preliminary colostomy having been performed. Needless to say, if there is evidence of extensive glandular involvement or of spread to organs, such as the liver, colostomy is the only way of relieving the situation, the major operation being contra-indicated, as the patient's doom is already sealed.

When the disease is located high up in the rectum, it may be removed by Kraske's operation, through a postero-median incision, the stump of the bowel, in cases in which the disease does not extend to the anus, may be freed and sutured to the anal portion, but, where there is no such healthy remainder to depend upon, a sacral anus must be made.

Where disease exists low down in the rectum, say three inches from the anus, the involved portion of gut may be resected, provided the disease has not seriously involved the neighbouring structures, such as the bladder or uterus, and the proximal portion of bowel be sutured to the anal canal.

The writer's experience of such cases is limited to those in the last group. In one instance several inches of the rectum were removed

and it was found possible, by freeing the bowel above, to bring it down and suture it to the anal portion. The patient, who had suffered from very troublesome constipation for three years before, exhibited, when the writer was called to see her first, a small ulcerated and indurated surface on the posterior wall of the rectum, about the size of a shilling.

The result of the operation was very satisfactory, inasmuch as the constipation and the back pain, from which she had complained, were completely removed. In four years thereafter, however, back ache and constipation returned and there was a recurrence of the disease at the level of the original growth; this spread round the bowel, involving the sacrum and the tissues in the pouch of Douglas. Death was due to spread of the disease to other organs and to toxæmia.

In other cases, the disease has progressed so far by the time the writer was consulted, that colostomy was the only remedial measure possible.

The writer has been impressed by the curious absence of symptoms which are of sufficient urgency as to suggest to the patient the need for consulting a medical man. Time and again, he has been consulted for the first time by patients whose only

complaint has been constipation and a feeling that the bowel was never properly emptied, and troublesome straining at stool. No blood may have been observed in the motions and little or no pain felt and yet he has found, it may be, a large fixed tumour infiltrating the surrounding tissues, which could not be removed by operation. Quite recently he attended a man, aged 36, who, as it turned out, had advanced rectal cancer. In this case, the main symptom was persistent diarrhoea, not constipation, which had existed for only a few weeks.

The lesson which the writer has learned is that in all cases above thirty years, complaining of constipation, with or without intermittent diarrhoea, or of persistent diarrhoea, he must examine the rectum and abdomen. Through neglect of this precaution he is conscious of having missed a correct diagnosis. At the same time, he has learned not to be denied an examination, because of scruples on the part of the patient.

A few years ago an angler, 75 years of age, consulted him regarding constipation and straining at stool; he refused rectal examination. With the return of the fishing season, he reappeared, the disability had grown worse. Rectal examination was permitted and a very large fixed growth

was felt within easy reach of the finger. In this particular case the late diagnosis did not matter much as the cardiac condition would have precluded operation at any time.

Another point which one has noticed is, as in the case just quoted, the very slow growth of rectal cancer in patients of advanced years. A patient, aged 72, lived for over ten years with an artificial anus, and the rectal growth which, when first discovered, practically filled the lumen of the rectum was not manifestly larger when death occurred. It may be that the colostomy relieved the growth from the irritation of faecal matter, it did not of course, prevent dissemination to gland and liver and toxæmia, which ultimately occurred.

## 2. Pressure upon the bowel from without.

This, as we have seen (page 28) is more common in women than in men, because of the frequent abnormalities in the female, pelvic, generative organs.

The erection of a retroverted gravid uterus, which generally occurs at the fourth month, the removal of a fibroid uterus or of an ovarian cyst, may be the means of restoring the normal function of the bowel.



### 3. Spasm.

The existence of spasmodic constipation has already been alluded to as occurring in neurotic individuals, mucous colitis and lead poisoning.

In dealing with the subject of mucous colitis, the writer mentioned that he is satisfied that there is very often a casual relation between the colitis and some morbid condition in the pelvis. He bases this belief upon the results in several cases, which have followed operation. To take one instance. A young woman, aged 38, suffered for over 15 years from intermittent attacks of mucous colitis with chronic constipation and was diagnosed to have an enlarged left ovary with probable adhesions to the pelvic colon. As the years passed she became more markedly neurasthenic, body nourishment poorer and she was more constantly afflicted with pain and discomfort in the side, and the evacuation continued to be typical. When at last she was prevailed upon to submit to operation, it was found that the diagnosis was confirmed and the treatment was amply justified. The enlarged ovary was removed, the adhesions were divided and the cut edges were carefully stitched over. The result has been eminently satisfactory; pain has been removed, constipation relieved, and there is a complete cessation of mucous

discharge. The general health has, at the same time, improved to a degree beyond expectation.

Certain conditions existing in the anal region may give rise to constipation, on account of spasm arising through the associated pain. Thus, when haemorrhoids exist and become inflamed, they should be removed at the earliest suitable opportunity; fissure of the anas necessitates free incision and division of the external sphincter; fistula in ano, where abscess forms, it may be without external opening, because of the pain involved, is a frequent cause of constipation. Treatment should be thorough division of the tissues between the point of projection of the abscess externally and the inner surface of the bowel, where it may be there is a fistulous opening.

4. Kinks of the intestines may be caused by adhesions, the result of surgical operations on the abdominal contents or of chronic peritonitis, particularly in the pelvic region, which have fixed the pelvic colon to the rectum or to the pelvic floor.

Arbuthnot Lane<sup>8</sup> lays stress on conditions, which, while they may directly or indirectly result from chronic stasis, in certain respects, tend to aggravate the condition of constipation.

He argues that the erect attitude in man tends to produce a dragging down by gravity of the abdominal viscera and that nature, recognising this, throws out buttresses in the form of peritoneal adhesions, which, while they support one organ, may be the means of greater intestinal difficulty; as, for instance, adhesions which may form between the right kidney and upper part of the ascending colon and again to the abdominal wall to overcome the drag of the caecum. The angle between the ascending colon and first part of the transverse colon becomes more acute and ultimately these two parts may become adherent to one another. Though this is more common of occurrence at the hepatic flexure, it may yet happen similarly at other flexures.

Herts has studied this question by the aid of X-rays and has satisfied himself that adhesions at the hepatic and splenic flexures do but rarely produce any permanent delay in the passage of faeces through the colon, though Dyschezia may be caused by pelvic peritonitis which has bound down the pelvic colon so that it can no longer be raised up by the passage into it of faeces.

Further, Lane<sup>8</sup> suggests that, given a condition of chronic intestinal stasis, the abortion of toxic products from the bowel leads to loss of vitality

of the organ, that there is a chronic peritonitis set up which results in adhesions and kinking, and that, at the same time, there is a state of general toxaemia set up which produces degenerative changes in all the structures of the body. "The material harm done directly or indirectly by imperfect intestinal drainage is unfortunately greater and more far reaching than that ascribed to alcohol, while the misery inflicted on the individual as well as on those who are brought into constant association, is often very intense." Incidentally he mentions that it is very unusual for those addicted to alcohol to suffer from intestinal stasis.

Divisions of adhesions, where these are in the form of bands, may, in suitable cases, give relief, but there is a risk of their reforming.

In those cases in which chronic intestinal stasis has been followed by auto-intoxication to such a degree that the health of the individual is seriously threatened, short circuiting operations, in which the ilium is implanted by lateral anastomosis into the pelvic colon, have been done with success, originally by Mansell Moullin.

In cases of Dyschezia due to obstruction at the pelvi-rectal flexure, anastomosis between the colon and the rectum has been performed with benefit.



In those cases of severe auto-intoxication Lane<sup>8</sup> recommends the very radical operation of removal of the colon as far as its junction with the pelvic colon, a union being made between the latter and the ilium.

In the Brit. Med. Journal<sup>12</sup> Lane recounts quite a number of cases in which this operation was performed by him, and the results reported certainly give one the impression that there is a field for this extensive denudation.

He guards his recommendation by saying that "in no circumstances should operative interference be contemplated until the surgeon has satisfied himself that every other means of treatment has failed."

Splanchnoptosis, or "Glenard's Disease" is a common concomitant of chronic constipation, and for its relief various operative measures have been devised, as this condition has come under the writer's observation, it has been practically always due to the lack of support by the abdominal muscles, or to tight lacing.

The treatment of the former condition consists in trying to develop the tone of the muscles by massage and exercises, as already described.

The wearing of a suitable abdominal support

is likewise advisable, the object of which should be to give a pressure from below upwards and backward in the line of action of the muscles themselves. This should be put on when the patient is lying down, with the knees bent up and the buttocks raised, in this position the abdominal organs replace themselves, as it were.

The modern straight fronted corset is a great improvement on its predecessors, inasmuch as there is an attempt at abdominal support and a diminution of harmful compression at the waist line.

#### CONSTIPATION IN INFANTS AND CHILDREN

Both in breast fed and in hand fed infants constipation is a very common trouble and is often very difficult to remedy. The most common causes of constipation in Infants and Children may be grouped under four heads:

1. Diet
2. Conditions giving rise to Muscular Atony.
3. Congenital defects.
4. Certain Cerebral conditions.

1. Diet. The stool may lack volume from deficiency

in fat or proteids, in older children this may be due to lack of vegetables or fruits, or it may be too great in bulk, as frequently happens in hand fed children, from excess of casein in cow's milk or from imperfect digestion owing to the milk having been boiled; the process of boiling renders the casein less digestible. In the former cases the lack of volume results in deficient stimulation of the weakly intestinal muscle, in the latter there will be such accumulation that the feebly developed muscle of the intestine is unable to propel the faeces along. In the rare condition known as Congenital Idiopathic Stenosis of the Pylorus the constipation, which is one of the associated symptoms, is due to the lack of food residue, the major part of the nourishment being lost in the vomiting which is so characteristic.

2. Muscular Atony is apt to be an important factor in the onset of constipation. In infancy and childhood the muscles have not yet acquired their strength or their habit, both of which come largely by education.

There may be also congenital weakness of peristalsis.

Apart from the constipation which results from

acute illness and which is due to consequent general weakness, we note that in Rickets we have constipation as a well marked accompaniment; this is due to muscular atony, at once associated with and caused by flatulent distension of the intestines and stretching of the abdominal muscles as a direct result, as well as to imperfect and unsuitable feeding.

### 3. Certain Congenital conditions.

Kinking of the colon at the pelvi-rectal junction. The pelvic colon in infants is relatively much longer than in the adult and should it be abnormally long, kinking may readily take place; the accumulation of faeces in the pelvic colon as a consequence will necessarily aggravate the condition.

Congenital Idiopathic Dilatation of the Colon is a rare condition in which evident peristalsis of the colon and marked constipation are the chief symptoms.

Congenital defects, such as Stenosis of or imperforate anus would be obvious causes of constipation.

### 4. Cerebral Diseases, such as Purulent and Tubercular Meningitis have constipation as a predominant symptom.



## T R E A T M E N T

Treatment may be divided into:

1. Prophylactic
2. Dietetic.
3. Mechanical.
4. Medicinal.
5. Surgical.

### 1. Prophylaxis.

To establish the habit of regular action of the bowels should be our first aim. It has already been mentioned how much may be done by an intelligent nurse or mother to help to this end.

In earliest infancy defaecation is a purely reflex act but in infants of a few weeks old, education may be begun in this relation.

The habit of regular evacuation may be induced by suggestion, by holding the infant over a suitable receiver at regular stated intervals; even though at first there may be no result, yet perseverance will be rewarded. It is best to make the first such suggestion immediately after the first or second feed of the day, and the second about twelve hours later. It is of equal importance that the child shall receive nourishment at strictly regular intervals.

It is clearly the duty of the parent to instil

into the minds of older children the importance of the function and the absolute necessity for intelligently attending to its performance.

All that has already been said in connection with prophylaxis in the adult (p. 39 et seq) applies equally here, to the cases of young and growing children.

## 2. Dietetic.

If the mother's milk is at fault, as very commonly is the case, the deficiency is most frequently in the quantity of fat. Thorough attention must in such circumstances be directed to the dietary of the mother; it should be liberal, with abundance of milk and cream and milky foods; fat may be added also in the form of cod liver or olive oil; careful attention should be given to the state of the mother's functions generally and her health promoted in every way possible.

In the cases of hand fed infants the fault will usually be found in the unsuitability of the proportions of casein and of fat as contained in cow's milk. If, in addition, it is found that the milk has been boiled, a further source of difficulty has arisen, as boiling diminishes the digestibility of casein.

By careful dilution of cow's milk with water

or barley or meal water, to reduce the excess of proteids, the addition of cream, where fat is deficient and of sugar of milk, to make up for the shortage of soluble carbohydrates, we may arrive at such a modification as will satisfactorily take the place of human milk and, at the same time, be free from the objections of milk taken direct from the cow. The milk in all such cases should, by preference, be sterilised.

One frequently prescribes the Extract of Malt or a little orange juice two or three times day, with advantage.

In older children, assistance will be given by an increase in the starchy foods and of fruit juices.

Growing children should be encouraged to eat freely of the coarser foods, such as oatmeal, in oatcakes or porridge, of brown bread and of fresh vegetables and fruits.

### 3. Mechanical.

Massage of the abdomen, by rubbing and kneading, is useful in children just as we have already observed in the treatment of adults.

### 4. Medicinal.

It is highly indiscreet to attack the condition

of chronic constipation by means of drugs, in the first instance, in the adult, and it is much more so in the case of infants and children. Such remedies should only be used when other means have had fair trial and have failed. It must be admitted that this may appear to be but a counsel of perfection when one is dealing with the poorer and less intelligent mothers, yet it is quite practicable when one has the assistance of a capable nurse or mother, who will take pains.

G. F. Still,<sup>13</sup> however, advocates the regular use of small doses of laxatives in young infants, continued over a period of weeks, in preference to any other method of treatment of constipation.

Of drugs, the most useful in the treatment of the constipation of young infants, the writer has found Manna most reliable; Sulphate of Magnesia, in small doses, repeated two or three times a day is also very effective.

For older children, Senna, as an infusion, cascara, as the "Evacuant" and Phenolphthalein are valuable.

In such cases as Rickets, where there is atony of the muscles, general treatment, consisting of massage and a well considered dietary, should be combined with such remedies as Nux Vomica and



general blood tonics.

The constipation of Meningitis must be treated by castor oil or salines or by enemata.

Enemata, in children, should be of small quantity, 2 to 4 ounces, so as to avoid the possibility of distension of the bowel, which would only defeat one's purpose. The technique of their administration and their composition have been already detailed in speaking of the constipation of the adult. Cold water injections are preferable as they are not so locally enervating as are warm fluids.

A common and homely method of stimulating the defaecation reflex is the use of a suppository or cone composed of Castile, or if that be not available, of ordinary "yellow" seap. This is more to be recommended than glycerine which is too irritating to the sensitive mucous membrane. The soap lubricates the canal and, at the same time, stimulates the nerve endings in the rectum.

## 5. Surgical.

In cases of Imperforate Anus operative treatment may, in suitable cases by division of the septum, relieve the condition.

Congenital Stenosis of the Anus may be treated by careful stretching, with the finger or bougie,

after, if need be, incision of the stricture.

Idiopathic Dilatation of the Colon, Hirschsprung's Disease, has already been referred to

With the treatment of the various other types of congenital abnormalities in the rectum and anus it is not necessary here to deal, as they are of comparatively great rarity.

#### IN CONCLUSION

From the above, although it is a very partial consideration of the wide subject of Chronic Constipation, one must conclude:

1. That the constipated state is of extremely common and widespread occurrence.
2. That, while it is not strictly speaking, a disease, but rather a symptom consequent on some morbid condition in some one or other of the systems of the body, yet its effects may be so far reaching and pernicious as to be more serious than those of the primary causal condition.

At the same time, there is a danger, in certain cases, of treating Chronic Constipation per se

and of overlooking the primary cause, which may be, though less apparent, of a very vital nature.

There are two dangers of treating such a frequent symptom as Chronic Constipation without making every effort to ascertain the cause:-

1. Constipation may be the only early symptom of a disease which, if diagnosed early, might be radically dealt with.
2. There are many, and often the most severe, cases of constipation in which a routine treatment of symptoms by purgatives and bulky diet may aggravate instead of cure the trouble.
3. That it is to a very large extent preventible, whether in the young or in those of more mature years.

That much can be done by the training and education of infants and of young children in the home, of scholars in the seminary, and of young men and women by literature and by lecture.

That parents and teachers are responsible for much suffering and ill health if, for reasons of delicacy or dalliance, they neglect to insist on the importance of the *Primæ Viæ*.

4. That the treatment of Chronic Constipation should not be undertaken before a full review of the case has been made.

Enquiries should be directed to the symptoms, heredity, habits and mode of life, particularly with reference to exercise, food and environment.

In many cases a diagnosis may be assisted materially by a rectal and an abdominal examination.

5. That each case must be treated on its own merits and that the three degrees of treatment, diet and exercise, drugs and surgery, must be apportioned only after a full consideration of each case.
6. That the object of treatment should be to recreate a natural desire and habit by the mildest means at one's disposal, and to continue the remedy for as short a time as is consonant with cure.



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